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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/088,503	03/28/2002	Shigeo Yamanaka	220802US2XPCT	2408

22850 7590 08/23/2005

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ART UNIT	**PAPER NUMBER**
2633	

DATE MAILED: 08/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/088,503	Applicant(s) YAMANAKA ET AL.	
	Examiner Christina Y. Leung	Art Unit 2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 June 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☒ Claim(s) *8* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 8 is objected to because of the following informalities:

2. Claim 8 recites "an amplifier of the slave rack for the second multiplexed signal" in lines 6-7 of the claim, but claim 1 one which it depends already recites such an amplifier in the last lines of that claim.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 recites "an optical amplifier in which the second multiplexed signal output from the second optical wavelength multiplexer is multiplied" in the last lines of the claim. There is insufficient antecedent basis for this limitation in the claim because the claim does not previously recite a "second optical wavelength multiplexer."

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1, 2, and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Archambault (US 6,567,196 B1) in view of Takeda et al. (US 6,091,538 A) and Tomonaga et al. (US 5,878,025 A).

Regarding claim 1, Archambault discloses an optical wavelength division multiplexing and transmission apparatus (Figure 12), comprising:

a first optical wavelength multiplexer (comprising combiners 1211, 1212, and filtering element 1221) in which a plurality of prescribed optical wavelength signals of a group are multiplexed with each other and a first multiplexed signal is output (on line 1241);

a synthetic optical wavelength multiplexer 1231 in which the first multiplexed signal output from the first optical wavelength multiplexer (on line 1241)and a second multiplexed signal (on line 1242) are multiplexed with each other and a synthetic multiplexed signal is output; and

a second optical wavelength multiplexer (comprising combiners 1213-1215 and filtering elements 1222 and 1223) in which a plurality of optical wavelength signals of a group having a wavelength distribution different from that of the group of prescribed optical wavelength signals multiplexed by the first optical wavelength multiplexer are multiplexed with each other and are output as the second multiplexed signal (on line 1242).

Archambault does not specifically disclose an optical amplifier in which the second multiplexed signal output from the second optical wavelength multiplexer is multiplied. However, Archambault does disclose that substantially uniform channel power is desired in a wavelength division multiplexed system (column 9, lines 43-48). Furthermore, Takeda et al. teach a WDM system related to the one disclosed by Archambault including first and second

multiplexers 12 and 14 whose outputs are combined at a synthetic multiplexer 22 (Figure 1) and further teach an amplifier 18 for amplifying the output of the second multiplexer

Regarding claim 4 in particular, Takeda et al. also teach a plurality of noise cut filters 20 corresponding to the first multiplexed signal and the second multiplexed signal respectively on an input side of the synthetic optical wavelength multiplexer 22 on which the first multiplexed signal and second multiplexed signal are input for eliminating noise caused by the optical amplifiers (column 2, lines 60-66). Figure 1 explicitly shows only one filter 20, but Takeda et al. teach that filters may be used on both the first and the second multiplexer outputs (column 3, lines 43-47).

Regarding claims 1 and 4, it would have been obvious to a person of ordinary skill in the art to include an amplifier at the output of the second multiplexer and filters as taught by Takeda et al. in the system disclosed by Archambault in order to equalize the groups of multiplexed signals relative to each other (Takeda et al., column 1, lines 51-67) and obtain substantially uniform channel power as already suggested by Archambault.

Further regarding claim 1, Archambault further does not specifically disclose a master rack and at least a slave rack possible to be combined with and coupled to the master rack. However, Tomonaga et al. teach that racks are commonly used to physically support and organize components in optical communications systems, and further teach that they may advantageously allow expansion of different parts of the communication system when a number of connections/wavelengths is increased (column 31, lines 47-67; column 32, lines 1-4). It would have been obvious to a person of ordinary skill in the art to use different racks as taught by Tomonaga et al. to support the first and second multiplexers in the system described by

Archambault in view of Tanaka et al. in order to modularize the sub-multiplexers and allow the system to be easily expanded to accommodate wavelengths as they are added to the communication system. Archambault already discloses that the disclosed multiplexer system is designed to be readily expandable by adding additional multiplexers to be combined with the first and second multiplexer at the synthetic multiplexer (column 8, lines 50-51).

Regarding claim 2, Archambault discloses an optical wavelength division multiplexing and transmission apparatus (Figure 1), comprising:

a synthetic optical wavelength demultiplexer (comprising splitter 110 and filtering elements 125-1 and 130-1) in which a synthetic multiplexed signal formed by multiplexing a plurality of multiplexed signals, which are respectively formed of a plurality of groups of optical wavelength signals having a plurality of optical wavelength distributions different from each other, with each other is received, the synthetic multiplexed signal is demultiplexed to both a first multiplexed signal and a second multiplexed signal and both the first multiplexed signal and the second multiplexed signal are output (as outputs from filtering element 125-1 and filtering element 130-1, for example);

a first optical wavelength demultiplexer 135-1 in which the first multiplexed signal output by the synthetic optical wavelength demultiplexer is demultiplexed to a plurality of optical wavelength signals of one group and the group of optical wavelength signals is output; and

a second optical wavelength demultiplexer 140-1 in which the second multiplexed signal output by the synthetic optical wavelength demultiplexer is demultiplexed to a plurality of

optical wavelength signals of another group and the group of optical wavelength signals is output.

Also, as well as the claim may be understood with respect to 35 U.S.C. 112, discussed above, Archambault discloses that the second multiplexed signal may be generally amplified by amplifier 101 as shown in Figure 1 prior to demultiplexing by the synthetic demultiplexer. Archambault does not specifically disclose an amplifier for amplifying the second multiplexed signal as it is output from the synthetic demultiplexer but does disclose that substantially uniform channel power is desired in a wavelength division multiplexed system (column 9, lines 43-48). Furthermore, again Takeda et al. teach a WDM system related to the one disclosed by Archambault. Takeda et al. also teach an amplifier 34 for amplifying the second mutlieplxed signal output from a synthetic demultiplexer 30 (Figure 6). It would have been obvious to a person of ordinary skill in the art to include an amplifier at the output of a synthetic demultiplexer as taught by Takeda et al. in the system disclosed by Archambault in order to equalize the groups of multiplexed signals relative to each other (Takeda et al., column 1, lines 51-67) and obtain substantially uniform channel power as already suggested by Archambault.

Again, Archambault further does not specifically disclose a master rack and at least a slave rack possible to be combined with and coupled to the master rack. However, Tomonaga et al. teach that racks are commonly used to physically support and organize components in optical communications systems, and further teach that they may advantageously allow expansion of different parts of the communication system when a number of connections/wavelengths is increased (column 31, lines 47-67; column 32, lines 1-4). It would have been obvious to a person of ordinary skill in the art to use different racks as taught by Tomonaga et al. to support the first

and second demultiplexers in the system described by Archambault in view of Tanaka et al. in order to modularize the sub-demultiplexers and allow the system to be easily expanded to accommodate wavelengths as they are added to the communication system. Archambault already discloses that the disclosed demultiplexer system is designed to be readily expandable by adding additional demultiplexers to be combined with the first and second demultiplexer at the synthetic demultiplexer (column 5, lines 34-51).

7. Claims 3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Clark et al. (US 6,041,152 A) in view of Takeda et al. and Tomonaga et al.

Regarding claim 3, Clark et al. disclose an optical wavelength division multiplexing and transmission apparatus (Figures 1 and 3A), comprising:

a first optical wavelength multiplexer 4 in which a plurality of prescribed optical wavelength signals of a group are multiplexed with each other and a first multiplexed signal is output, and

a synthetic optical wavelength multiplexer (part of DWDM combiner 1, comprising circulator 41 and filter 48 in Figure 3A) in which the first multiplexed signal output from the first optical wavelength multiplexer and a second multiplexed signal are multiplexed with each other and a synthetic multiplexed signal is output (to port 44 of circulator 41; column 6, lines 54-65),

a synthetic optical wavelength demultiplexer (part of DWDM combiner 1, comprising circulator 40 and filter 52 in Figure 3A) in which a second synthetic multiplexed signal transmitted from another optical wavelength division multiplexing and transmission apparatus of an opposite end through an optical transmission line is demultiplexed to both a third multiplexed

signal and a fourth multiplexed signal and both the third multiplexed signal and the fourth multiplexed signal are output (to ports 49 and 50 of circulator 40; column 7, lines 5-14), and

a first optical wavelength demultiplexer 6 in which the third multiplexed signal output from the synthetic optical wavelength demultiplexer is demultiplexed to a plurality of optical wavelength signals of one group and the group of optical wavelength signals is output, and

a second optical wavelength multiplexer 5 in which a plurality of optical wavelength signals of a group having a wavelength distribution different from that of the group of prescribed optical wavelength signals multiplexed by the first optical wavelength multiplexer are multiplexed with each other and are output as the second multiplexed signal, and

a second optical wavelength demultiplexer 7 in which the fourth multiplexed signal output by the synthetic optical wavelength demultiplexer is demultiplexed to a plurality of optical wavelength signals of another group and the group of optical wavelength signals is output

Clark et al. do not specifically disclose an optical amplifier in which the second multiplexed signal output from the second optical wavelength multiplexer is multiplied. However, Takeda et al. teach a WDM system related to the one disclosed by Clark et al. including first and second multiplexers 12 and 14 whose outputs are combined at a synthetic multiplexer 22 (Figure 1) and further teach an amplifier 18 for amplifying the output of the second multiplexer.

Regarding claim 5 in particular, Takeda et al. also teach a plurality of noise cut filters 20 corresponding to the first multiplexed signal and the second multiplexed signal respectively on an input side of the synthetic optical wavelength multiplexer 22 on which the first multiplexed signal and second multiplexed signal are input for eliminating noise caused by the optical

amplifiers (column 2, lines 60-66). Figure 1 explicitly shows only one filter 20, but Takeda et al. teach that filters may be used on both the first and the second multiplexer outputs (column 3, lines 43-47).

Regarding claims 3 and 5, it would have been obvious to a person of ordinary skill in the art to include an amplifier at the output of the second multiplexer and filters as taught by Takeda et al. in the system disclosed by Clark et al. in order to equalize the groups of multiplexed signals relative to each other (Takeda et al., column 1, lines 51-67).

Further regarding claim 3, Clark et al. further do not specifically disclose a master rack and at least a slave rack possible to be combined with and coupled to the master rack. However, Tomonaga et al. teach that racks are commonly used to physically support and organize components in optical communications systems, and further teach that they may advantageously allow expansion of different parts of the communication system when a number of connections/wavelengths is increased (column 31, lines 47-67; column 32, lines 1-4). It would have been obvious to a person of ordinary skill in the art to use different racks as taught by Tomonaga et al. to support the first and second multiplexers in the system described by Clark et al. in view of Tanaka et al. in order to modularize the sub-multiplexers and allow the system to be easily expanded to accommodate wavelengths as they are added to the communication system. Clark et al. already disclose that the disclosed multiplexer/demultiplexer system is designed to be readily expandable by adding additional multiplexers and demultiplexers to be combined with existing first and second multiplexers and demultiplexers (column 7, lines 15-28).

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Archambault in view of Takeda et al. and Tomonaga et al. as applied to claim 1 above, and further in view of Yamamoto et al. (US 6,021,235 A).

Regarding claim 6, Archambault in view of Takeda et al. and Tomonaga et al. describe a system as discussed above with regard to claim 1 but do not specifically disclose or suggest a plurality of dispersion compensation fibers. However, Yamamoto et al. teach a system related to the one described by Archambault in view of Takeda et al. and Tomonaga et al. including wavelength division multiplexing optical signals (Figure 9). Yamamoto et al. further teaches a plurality of dispersion compensation fibers 3 corresponding to the inputs of a wavelength multiplexer. It would have been obvious to a person of ordinary skill in the art to include a plurality of dispersion compensation fibers as taught by Yamamoto et al. at the inputs of the multiplexer in the system described by Archambault in view of Takeda et al. and Tomonaga et al. in order to mitigate the effects of dispersion and thereby more effectively transmit the signals.

9. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Clark et al. in view of Takeda et al. and Tomonaga et al. as applied to claim 3 above, and further in view of Yamamoto et al.

Regarding claim 7, Clark et al. in view of Takeda et al. and Tomonaga et al. describe a system as discussed above with regard to claim 1 but do not specifically disclose or suggest a plurality of dispersion compensation fibers. However, Yamamoto et al. teach a system related to the one described by Clark et al. in view of Takeda et al. and Tomonaga et al. including wavelength division multiplexing optical signals (Figure 9). Yamamoto et al. further teaches a plurality of dispersion compensation fibers 3 corresponding to the inputs of a wavelength

multiplexer. It would have been obvious to a person of ordinary skill in the art to include a plurality of dispersion compensation fibers as taught by Yamamoto et al. at the inputs of the multiplexer in the system described by Clark et al. in view of Takeda et al. and Tomonaga et al. in order to mitigate the effects of dispersion and thereby more effectively transmit the signals.

10. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Archambault in view of Takeda et al. and Tomonaga et al. as applied to claim 1 above, and further in view of Kosaka (US 5,675,432 A).

Regarding claim 8, as well as the claim may be understood with respect to the claim objection discussed above, Archambault in view of Takeda et al. and Tomonaga et al. describe a system as discussed above with regard to claim 1, and Takeda et al. further teaches amplifiers 16 and 18 for first and second multiplexed signals respectively (Figure 1). Archambault in view of Takeda et al. and Tomonaga et al. do not further suggest an amplifier for a synthetic multiplexed signal or a wavelength level monitoring device.

However, Kosaka teaches a system related to the one described by Archambault in view of Takeda et al. and Tomonaga et al. including wavelength division multiplexing optical signals (Figure 4). Kosaka teaches amplifying individual inputs to a multiplexer 19 (using elements 17b and 17c) and further amplifying the output of the multiplexer (using element 9; column 5, lines 28-45). Kosaka further teaches a wavelength level monitoring device (control unit 14) for monitoring an output of the multiplexer 19.

It would have been obvious to a person of ordinary skill in the art to include an additional amplifier and a wavelength level monitoring device as taught by Kosaka in the system described by Archambault in view of Takeda et al. and Tomonaga et al. in order to optimize the

amplification of the signals relative to each other. Archambault already discloses that substantially uniform channel power is desired in a wavelength division multiplexed system (column 9, lines 43-48).

Response to Arguments

11. Applicants' arguments filed 07 June 2005 with respect to the rejections of claims 1-8 have been fully considered and are persuasive. Therefore, the rejections have been withdrawn. However, upon further consideration, new grounds of rejection are made in view of Archambault in view of Takeda et al. and Tomonaga et al., and Clark in view of Takeda et al. and Tomonaga et al. (as well as in view of Yamamoto et al. and Kosaka in various dependent claims).

12. Applicants' arguments filed 07 June 2005, with respect to the 35 U.S.C. 112 rejection of claim 2 is not persuasive, and Examiner maintains the 35 U.S.C. 112 rejection of claim 2 as discussed above. Although Applicants have asserted on page 3 of their response that antecedent basis for the limitations is found in the phrase "a structure body of the slave rack accommodates a second optical wavelength demultiplexer," Examiner respectfully notes that this phrase only recites a *demultiplexer*, not a multiplexer.

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christina Y. Leung whose telephone number is 571-272-3023. The examiner can normally be reached on Monday to Friday, 6:30 to 3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571-272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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